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Michigan Department of State Police

Michigan Hazard Mitigation Plan

(Updated March 2014 edition)

Reducing hazard risks and vulnerabilities through education, planning, physical improvements, early warning, and coordination of programs and resources.

Prepared by:

Emergency Management and Homeland Security Division
Michigan Department of State Police

And

The Michigan Citizen-Community Emergency Response Coordinating Council

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Michigan Hazard Mitigation Plan

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MICHIGAN HAZARD MITIGATION PLAN

This plan, developed and maintained pursuant to 1976 PA 390, as amended, and the federal Disaster Mitigation Act of 2000 (PL 106-390) and its implementing regulations found at 44 CFR Part 201, is hereby adopted for the State of Michigan. All participating state departments and agencies will work in conjunction with the Michigan Citizen-Community Emergency Response Coordinating Council (MCCERCC) and the Michigan Department of State Police / Emergency Management and Homeland Security Division (MSP/EMHSD) to implement those goals and objectives contained in the plan that are applicable to their respective department or agency. In addition, the State of Michigan will, in accordance with 44 CFR 13.11 c, comply with all applicable Federal statutes and regulations in effect with respect to the periods for which it receives grant funding for hazard mitigation. Further, in accordance with 44 CFR 13.11 d, the State of Michigan agrees to amend this plan whenever necessary to reflect new or revised federal statutes or regulations or material changes in any state law, organization, policy or state department or agency operation.

Chris A. Kelenske /CAPT

Capt. Chris A. Kelenske, Chairperson, Michigan Citizen-Community
Emergency Response Coordinating Council
and Deputy State Director of Emergency Management and Homeland Security

4/15/14
Date

Col. Kriste Kibbey Etue

Col. Kriste Kibbey Etue, State Director of Emergency Management and Homeland Security

4/16/14
Date

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Official Promulgation Letter – Governor's Office

MICHIGAN HAZARD MITIGATION PLAN

This plan, having been approved and adopted by the Michigan Citizen-Community Emergency Response Coordinating Council (MCCERCC) and the State Director of Emergency Management and Homeland Security (Colonel Kriste Kibbey Etue) and Deputy State Director of Emergency Management and Homeland Security (Captain Chris A. Kelenske), is hereby officially adopted for the State of Michigan in accordance with the federal Disaster Mitigation Act of 2000 (PL 106-390) and its implementing regulations found at 44 CFR Part 201.

Rick Snyder, Governor

4/17/2014

Date

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Michigan Hazard Mitigation Plan: Background Information

Introduction to Hazard Mitigation

What is Hazard Mitigation?

Hazard mitigation is defined as any action taken before, during, or after a disaster or emergency to permanently eliminate or reduce the long-term risk to human life and property from natural, technological and human-related hazards. It is an essential element of emergency management, along with preparedness, response and recovery. When successful, hazard mitigation will lessen the need for a community to respond to subsequent hazard events; that is, incidents will remain incidents and not become disasters.

State Government Role

Hazard mitigation strives to reduce the impact of hazards on people and property through the coordination of resources, programs, initiatives and authorities. State government has a vital coordinating role to play in this effort. Laws and processes governing the use of land and development of property originate at the state level. In addition, state agencies administer a wide variety of programs that affect – either directly or indirectly – the development and use of land. For these reasons, state government is the logical level of origination for hazard mitigation measures that have statewide application and/or implications.

Local Government Role

The implementation of hazard mitigation measures is inherently a local government function since that is the level at which development occurs, and most of the land use and development mechanisms available to implement hazard mitigation measures are applied at the local level. Therefore, successful implementation of a program to reduce Michigan's vulnerability to hazards will, out of necessity, be a joint cooperative effort between the state, local governments, and the private sector (since most land development is undertaken by private entities).

Coordination of Ongoing Efforts

Coordination is probably the most critical factor in a successful hazard mitigation effort or program. Many state and local agencies (as well as some private sector organizations) are already performing functions or administering programs that in some way contribute to hazard mitigation. Examples of existing, ongoing activities that promote or can contribute to hazard mitigation include but are not limited to:

- Capital improvements planning;
- Budgeting;
- Site-specific hazardous material emergency planning (through Local Emergency Planning Committees);
- Watershed management planning;
- Solid waste management planning;
- Local community planning and zoning activities;
- Regional planning;
- Transportation planning;
- Recreation planning;
- Forest management;
- Coastal zone management;
- Infrastructure design, regulation and permitting;
- Floodplain management; and
- Public facility design and construction review.

Unfortunately, coordination of these programs and activities for the purpose of achieving widespread hazard risk and vulnerability reduction is often limited, if it occurs at all.

Michigan Citizen-Community Emergency Response Coordinating Council

Before the late 1990s, the lack of a central focus and coordinating element for hazard mitigation in Michigan had long hampered the development of an effective statewide program of hazard risk and vulnerability reduction. In response to that problem, Governor John Engler signed Executive Order 1998-5 on July 29, 1998, creating the Michigan Hazard Mitigation Coordinating Council (MHMCC) to fill the void of hazard mitigation coordination at the state level. The MHMCC existed for nine years and officially met a total of 31 times. The MHMCC had many noteworthy accomplishments, the most prominent of which included:

- Selection of over 160 hazard mitigation projects, totaling in excess of $45 million in project costs, for four federal hazard mitigation grant programs. This included projects related to three federally-declared major disasters.
- Assisting in the development of Michigan Executive Directive 2001-5 (State Flood Hazard Mitigation), signed by Governor John Engler on September 11, 2001.
- Assisting in the development of the initial Michigan Hazard Mitigation Plan in 2004 (certified as federal Disaster Mitigation Act of 2000 compliant on March 23, 2005).
- Assisting in the development of Michigan's "Most Wanted Hazard Mitigation Measures" list as a component element of the Council's Annual Report of Activities to the Governor and Michigan Legislature.
- Assisting in the development of post-incident Hazard Mitigation Strategies for three federally-declared major disasters (1346-DR-MI; 1413-DR-MI; and 1527-DR-MI).
- Selection / coordination of four "Project Impact" communities in Michigan (City of Midland – 1998; Ottawa County – 1999; City of Dearborn – 2000; and Ingham County – 2001) as part of the federal Project Impact Initiative that existed from 1997 to 2002.
- Assisting in the development of a statewide repetitive flood loss reduction project (pilot effort currently ongoing in the Village of Estral Beach, Monroe County).
- Assisting in the development of a statewide local hazard mitigation planning project to develop plans covering all 83 counties.
- Assisting in the development of a statewide hazard mitigation marketing and education campaign for seven targeted professional groups.

On May 2, 2007, the MHMCC was abolished by Governor Jennifer Granholm's Executive Order 2007-18 and replaced by the new Michigan Citizen-Community Emergency Response Coordinating Council (MCCERCC). This new advisory body combines the MHMCC with the Michigan Citizen Corps Council and the Michigan Emergency Planning and Community Right-to-Know Commission (which were also abolished) to form a single entity chaired by the Department of State Police. The new Council is responsible for developing and implementing emergency response and hazard mitigation plans for the state. Executive Order 2007-18 transferred the MHMCC's hazard mitigation responsibilities intact to the new MCCERCC. The MCCERCC membership was announced on August 29, 2007, and its first meeting was held on January 29, 2008.

The MCCERCC is chaired by the Emergency Management and Homeland Security Division of the Michigan Department of State Police (MSP/EMHSD) and is composed of 19 representatives, including the Directors of (or a designee from) the Michigan Departments of State Police, Agriculture and Rural Development, Community Health, Environmental Quality, Military and Veterans Affairs, and Transportation; the State Fire Marshal; the Michigan Community Service Commission; plus 11 other representatives appointed by the Governor. Provisions in the Executive Order allow for the hiring or retention of contractors, subcontractors, advisors, consultants, and agents, as required when specific issues are addressed that require specialized expertise or technical knowledge.

Executive Order 2007-18 charges the MCCERCC with four primary hazard mitigation responsibilities:

- Assisting in the development, maintenance, and implementation of a state hazard mitigation plan.
- Assisting in the development, maintenance, and implementation of guidance and informational materials to support the hazard mitigation efforts of local and state government, and private entities.

- Soliciting, reviewing, and identifying hazard mitigation projects for funding, including but not limited to federal funding under Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 USC 5170c, and Sections 553 and 554 of the National Flood Insurance Reform Act of 1994, 42 USC 4104c and 42 USC 4014d.
- Fostering and promoting, where appropriate, hazard mitigation principles and practices within local and state government, and with the general public.

The MCCERCC committee structure includes a Hazard Mitigation Committee. The hazard mitigation committee was formed to oversee and focus on the Council's four hazard mitigation responsibilities. As described in a later section of this plan, both the committee and the council have been actively involved in the review and update of the 2014 Michigan Hazard Mitigation Plan.

Vision Statement
"To reduce, prevent, and prepare for emergencies or disasters"

Mission Statement
"To support and enhance Michigan's homeland security, community health, public safety, and all-hazards preparedness with responsible leadership and planning."

Just as the MCCERCC has assisted in maintaining, and implementing the 2008 and 2011 plans, it has helped to update the 2014 plan, and will continue to support and promote hazard mitigation concepts, principles, strategies and practices within governmental agencies and private sector organizations in Michigan. The latter can be accomplished in a variety of ways, including:

- Amendments to laws, rules, regulations, plans, and procedures;
- Changes in governmental and business practices and processes;
- Public education and awareness campaigns;
- Coordination of programs, information, initiatives and resources;
- Development of structural and non-structural projects to mitigate location-specific hazard vulnerabilities; and
- Establishment of collaborative public/private partnerships to identify, develop, and implement specific hazard mitigation opportunities for local, regional, or statewide application.

The primary advantage of the MCCERCC is that it fosters improved coordination of ideas, expertise, talent, programs, laws, rules and regulations, philosophies, and material resources. Such coordination manifests itself in many ways, including but not limited to:

- Better and faster delivery of hazard mitigation programs and services (during disaster and non-disaster times);
- Less duplication of and overlap between actions and activities;
- Improved information flow among agencies, levels of government, and between public and private entities;
- Development and implementation of multi-objective projects with fewer resources expended;
- Greater understanding of mitigation issues and concerns (issues are addressed by multiple agencies with multiple perspectives); and
- Greater cost savings to the taxpayers due to reduced future damages from disasters and reduced response and recovery costs (and due to the reasons listed above).

With the leadership provided by the MCCERCC, it is hoped that this plan will provide the structure and coordination mechanism necessary to bring together the many disparate, yet interrelated programs and activities that promote hazard mitigation to achieve an effective, meaningful hazard vulnerability reduction strategy for the state.

For more specific information about current MCCERCC membership, and Executive Order No. 2007-18, please refer to Attachment D in the back section of this plan.

Hazard Mitigation: Unlocking the Disaster Equation

Perhaps the best way to understand hazard mitigation is to first understand the nature of disasters themselves. The basic equation for a disaster is simple: **Hazards + People and Structures = Disaster.** Disasters only occur because people and structures are in harm's way. The key to preventing or limiting disaster damage and impact is to unlock and separate the key components of this equation. Controlling the hazard may be difficult or impossible (a tornado is a good example), but there are situations in which vulnerability can be effectively reduced. (See strategy numbers 2 through 4 below for more information.) Modifying the characteristics of people and structures is often easier and more effective in reducing or eliminating hazard vulnerability because these elements are more closely under our control. However, even that can be a daunting proposition at times, given the freedom of choice that Americans value and the widespread appeal of living near water, in the woods, on hillsides, or in other hazard-prone or at-risk areas.

The following are five basic hazard mitigation strategies that can reduce or prevent the harmful interaction between hazards, people, and development that results in a disaster:

Strategy #1: Modification of the Hazard

The first strategy involves modification of the hazard itself, which involves removing or eliminating the hazard, reducing its size or amount, or controlling the rate of release of the hazard. In the right circumstances, this strategy can be successful, but it is often difficult to do. Examples of this strategy include cloud seeding, slope planting to prevent erosion, and stream widening or modification to improve water flow. These measures can be cost-effective, but their application is normally limited and therefore not always as effective as other strategies in reducing or eliminating damage on a wide scale.

The four remaining mitigation strategies involve modification of the people and structures portion of the disaster equation.

Strategy #2: Segregating the Hazard

Strategy number two, segregating the hazard, attempts to *"keep the hazard away from people."* This is often accomplished in flood-prone areas through the construction of structural protection measures such as dams, levees, floodwalls, debris basins and other public works projects designed to redirect the impacts of a flood away from people and development. This strategy can be highly effective, but it can also be expensive and in some cases can cause (or exacerbate) environmental problems. Also, history has shown that structural protection measures constructed to protect one community can increase problems in other communities (e.g., levees that channel and increase the velocity of floodwaters, causing severe flooding downstream). Economics and limited effectiveness may make this a marginal strategy in many situations and locations.

Strategy #3: Preventing or Limiting Development

The third strategy involves preventing or limiting development in locations where people and development would be at risk. This approach is based on *"keeping the people away from the hazard"* and includes a variety of land use planning and development regulation tools, such as comprehensive planning, zoning, floodplain management ordinances, capital improvements planning, disclosure laws, and acquisition and relocation of hazard prone properties. This approach attempts to reduce or eliminate community hazard vulnerability through wise and prudent land use and development decision-making. When properly applied, this strategy can be highly effective in promoting safe, sustainable development.

Strategy #4: Altering Design or Construction

The fourth strategy involves alteration of the design or construction of development to make it less vulnerable to disaster damage. This strategy, commonly known as *"interacting with the hazard,"* allows the hazards to interact with human systems that have been designed and planned to withstand potentially destructive impacts. Examples of this strategy include elevating structures, employing wet and dry flood-proofing to improve flood damage resistance,

managing vegetation buffer zones in urban/wildland intermix areas, using wind bracing to improve wind damage resistance, and insulating water and sewer lines to prevent ground freeze damage. This strategy allows development in hazard prone areas, but requires that the development meet stringent disaster resistant performance criteria. In many situations, this approach balances the dual needs of enhancing a community's economic base while at the same time reducing community hazard vulnerability. History has shown that the two goals are not mutually exclusive. When careful and prudent development decisions are made that take into account the reduction of hazard vulnerabilities, the result is safe and sustainable community development.

Strategy #5: Early Warning and Public Education (overlaps with emergency management preparedness/response)
This strategy seeks to ensure that the public is aware of the hazards it faces, and that proper warning and communication systems and practices are in place to save lives and protect property. This strategy should be applied in all communities, as it is typically the last line of defense against serious disaster related injury or loss of life.

Hazard Mitigation: Corrective and Preventive
Alternatively, hazard mitigation strategies can also be grouped into two broad categories:

- **CORRECTIVE MITIGATION –** correcting past practices that have increased hazard vulnerability; and
- **PREVENTIVE MITIGATION –** preventing future problems from occurring in the first place through public education, wise decision-making, and disaster-resistant building / development practices.

The Corrective form of hazard mitigation can be expensive, resource intensive, time consuming, and sometimes only marginally effective. Structural protection measures, hazard modification, and large-scale retrofitting fall under this category. Attempting to go back and fix something that is problematic is almost always more difficult than doing it right the first time. However, when dealing with hazard prone property (i.e., structures in a floodway, floodplain or other hazard area), it is often necessary to go back and try to correct the problem in order to protect the affected community and individual property owners from future harm.

The Preventive form of hazard mitigation is desirable because it seeks to prevent future problems from occurring in the first place. Wise land use planning and building design, small-scale retrofitting, and early warning and public education fall under this category. When it comes to reducing community hazard vulnerability, the old adage "an ounce of prevention is worth a pound of cure" certainly makes sense. (Or, with hazard mitigation, perhaps it is more appropriate to say "an ounce of mitigation is worth a pound of recovery!") Doing it right the first time is almost always preferable to going back and trying to correct recurring problems at a later date. Preventive mitigation is generally easier to implement than corrective mitigation because the administrative mechanisms that guide the land development process – planning and plan review, zoning, capital improvements programming, building codes and standards, etc. – are available to every local community and only require adoption and consistent application to be highly effective in reducing or eliminating hazard vulnerability.

This plan addresses both types of hazard mitigation—an ideal hazard mitigation program will involve both types being applied in appropriate amounts, in appropriate places, in a coordinated fashion. **However, particular emphasis is placed on the preventive form of hazard mitigation, since this approach is generally more flexible and cost-effective and can significantly reduce or eliminate future hazard vulnerability.** The preventive form of hazard mitigation can help ensure that, at the very least, the state and local governments do not contribute to the increasing severity of the problem through unwise decision-making. The corrective form of hazard mitigation measures, on the other hand, are emphasized for areas that suffer recurring or particularly severe disaster damages and impacts or that offer clear hazard mitigation opportunities that can be addressed with existing resources.

Please refer to the following sections that appear later in this plan, for more specific information about mitigation alternatives, the evaluation of alternatives, and Michigan's chosen mitigation objectives for 2014: Risk and Vulnerability Assessments Section, Hazard Analysis Sections, Hazard Mitigation Tools and Measures, State Hazard Mitigation Goals and Objectives, Attachment C (Hazard Mitigation Funding Sources and Projects), Attachment E (State Flood Mitigation Plan), and Attachment F (Hazard Mitigation Strategies for Federally Declared Disasters).

Michigan's Vulnerability to Hazards

Michigan is vulnerable to a wide range of natural, technological and human-related hazards. Although Michigan is fortunate in that it is generally not susceptible to catastrophic disasters involving major earthquakes or hurricanes, it nonetheless has its share of potentially severe and/or widespread disasters and emergencies. As a relatively heavily populated state with thousands of inland lakes, hundreds of rivers and streams, over 3,200 miles of Great Lakes shoreline, numerous major manufacturing centers, frequent wind and winter storms, and lying on the northern fringe of the nation's tornado belt, Michigan experiences major disasters and emergencies on a regular basis.

The Hazard Analysis section in this document describes the state's vulnerability to more than two dozen different types of natural, technological, and human-related hazards, ranging from civil disturbances to snowstorms. Although Michigan can potentially be affected in some way by all of these hazards, several of them cause more disaster events and generally result in more damage and/or impact to affected communities than the others. (Summaries and analyses appear in the Hazard Analysis sections of this plan.)

Since 1953, Michigan has experienced 34 events that resulted in the declaration of a major disaster or emergency by the President. Since 1977, Michigan has experienced 64 events that resulted in a Governor's declaration of disaster or emergency. The majority of those declarations, at both levels, were granted for flooding, tornadoes, winter storms, or severe thunderstorms. These disasters or emergencies resulted in hundreds of millions of dollars in damage and destruction and caused tremendous disruption to the affected communities. Clearly, there is a need to focus hazard mitigation efforts on those four hazards in particular. In addition, wildfires occur with regularity across much of the state and can severely impact the safety and well being of affected communities. Local plans confirm that wildfires are significant throughout Northern Michigan, and therefore wildfire mitigation is an important priority as well. In addition to these natural hazards, FEMA is also requiring the state of Michigan to address land subsidence, coastal erosion, extreme temperatures, dam failures, earthquakes, and drought as part of this plan revision.

For a detailed analysis of these hazards, please refer to the "hazard analysis" section that forms the core of this plan. For summaries of all declared state and federal disaster and emergency declarations in Michigan, please refer to Attachment B in the back section of this document. For the text of hazard mitigation strategies stemming from recent federally-declared disasters, please refer to Attachment F, toward the end of this document.

Hazard Mitigation: National Perspective and Federal Government Role

Nationally, hazard mitigation is at a crossroads. Recent catastrophic disasters across the United States have resulted in unparalleled devastation, suffering, and economic loss. These events have suggested that certain aspects of development strategy throughout the U.S. have been on a collision course with our natural environment. Increased development in hazard prone areas has put an ever-increasing number of people and structures in harm's way, greatly exacerbating our risk and vulnerability to natural, technological, and human-related hazards. As a result, when disasters occur they increasingly cause tremendous economic, social, and physical losses to the communities and people they affect. Fortunately, Michigan's less rapid rate of development currently offers many of its communities a chance to prevent many risks in the state from increasing with time, though appropriate plans and policies. (Michigan was the only state to decline in population between the previous U.S. censuses, although this trend did not bring a halt to ongoing trends of greenfield development patterns.)

National efforts are also under way to promote resilient communities and hazard mitigation. Grant programs and updated guidance from the Federal Emergency Management Agency have supported the development of plans, nationwide. The National Mitigation Strategy, National Pre-Disaster Mitigation Plan, National Flood Insurance Program (NFIP), Flood Mitigation Assistance Program (FMAP), Hazard Mitigation Grant Program (HMGP), Pre-Disaster Mitigation Program (PDMP), and the Disaster Mitigation Act of 2000 are the most prominent of the federal government's current efforts to reduce or eliminate the nation's risk and vulnerability to hazards. FEMA's efforts are in partnership with federal agencies, the Congress, the states, local governments, academia, the private sector, and individual citizens. The approach is one that invites the participation of the whole community—public, private, non-profit, and the civil sectors.

Balancing Competing Priorities

The state of Michigan has been an active partner in hazard mitigation activities for many years, through the development and implementation of this plan and through its extensive support for the development and implementation of counterpart hazard mitigation plans at the local government level. The first phase of local plan development has come to an end as the vast majority of Michigan counties have now developed FEMA-approved local hazard mitigation plans. This was a huge step in a large proactive effort to reduce the state's risk and vulnerability to hazards. Now, many local hazard mitigation plans need to be successfully updated as part of an ongoing 5-year cycle, with each update required to pass official FEMA review. This updated Michigan Hazard Mitigation Plan provides a foundation for these proactive and sustained hazard mitigation efforts in the state of Michigan. Subsequent steps have involved the actual implementation of the hazard mitigation plans, as resources and circumstances permit. In addition to plan implementation, considerable work still needs to be done, assisted by the MCCERCC, to ensure that mitigation programs, plans, initiatives, resources, laws, rules and regulations are coordinated to work more smoothly and efficiently, and to meet state mitigation goals and objectives. Considerable work must also be done to educate the public about the benefits of mitigation and the need for a proactive, sustained hazard mitigation effort at all levels of government and within the private sector. Greater coordination between public and private agencies at all levels, and between tribal, non-profit, and academic institutions should also be promoted.

This multi-hazard, state-level hazard mitigation plan is designed to promote and achieve better coordination among agencies, maintain and enhance an evidence-based assessment and prioritization of hazard mitigation actions at all levels, and to build and sustain awareness and education about hazard risks and vulnerabilities among all stakeholders and residents in Michigan. This plan has in many ways sought a unified approach to emergency management—overcoming arbitrary or artificial distinctions between "preparedness," "prevention," "response," "recovery," and "mitigation" by taking a broader approach to hazard mitigation to emphasize any and all activities that help to protect, sustain, and improve Michigan's people, property, environment, economy, and quality of life. This design is in accordance with the standards of the Emergency Management Accreditation Program, whose full accreditation Michigan had obtained in April 2011.

Hazard Mitigation: Creating Safe, Sustainable Communities

Background Note: It must be emphasized that the focus and intent of this plan is not to encourage wholesale limits on development or in any way to usurp the authority or scope of local land use and land development decision-making. Land use decisions in Michigan, by and large, have been made by local officials based on local priorities and conditions. What this plan seeks to promote is *safe, sustainable development and communities* by integrating hazard mitigation considerations into everyday governmental and private sector business practices and processes. This in turn will help reduce injuries and loss of life, property and environmental damage, and adverse economic, social and service impacts caused by natural, technological, and human-related hazards.

To create and maintain safe, sustainable communities, **both preventive and corrective forms of hazard mitigation must occur at the state and local levels.** An example of the preventive form of hazard mitigation at the local level would be a policy requiring that all future development occur in such a way as to avoid or reduce, to the extent possible, community exposure and vulnerability to hazards. That would prevent the scope and magnitude of the problem from increasing. The corrective form of hazard mitigation therefore could be applied in those areas that already have a high degree of exposure and vulnerability to certain hazards and therefore suffer severe and/or repetitive damage as a result. Such actions would correct current problems caused by unwise and/or outdated land development patterns.

Because disasters can be particularly devastating for private businesses and industry, creating and maintaining safe, sustainable communities makes "business sense" as well. The statistics related to business losses and disasters are alarming. For example, statistics from the National Fire Protection Association (NFPA) show that 40% of organizations that suffer a major disaster of any kind go out of business within one year. A University of Minnesota study found that 93% of all businesses that lost their data centers for 10 days or more went out of business – 50% filing for bankruptcy almost immediately. A follow up study by Datapro Research found that 43% of the businesses in the University of Minnesota study never reopened, and an additional 29% went under within two years. Clearly, creating and maintaining safe, sustainable communities through the implementation of mitigation measures at the state and local government levels is in the best interests of private business and industry.

As stated previously, this plan addresses both types of hazard mitigation but emphasizes the preventive form to most efficiently and effectively keep the scope and magnitude of future problems in check.

Hazard Mitigation Plans Identify and Create Implementable Hazard Mitigation Opportunities

It must be emphasized that the hazard mitigation measures identified in this plan and in counterpart local plans are, in reality, **hazard mitigation opportunities.** Identification of a possible hazard mitigation measure does not necessarily mean that it can or even should be implemented. Implementation (and the desirability) of a hazard mitigation measure is highly dependent on a number of factors—environmental, social, economic and political. Just because a measure may reduce or eliminate the effects of a hazard does not necessarily mean that it should be implemented. There may be extenuating factors or circumstances that could or should preclude its implementation. Those decisions will be made in the local and state political arenas and in the land use and land development decision-making processes. Typically, hazard mitigation measures will be implemented if they are able to balance environmental, social, economic and political factors, and are cost-effective. It does not make sense to implement a measure that will not be supported by state and/or local officials and the citizenry, or that cannot be economically justified.

Accomplishing everything proposed in this plan will be a very tall order and will take years. Nevertheless, it is important to the future of this state that these issues be addressed, at least to some degree. Our nation, our state, our local communities and the insurance industry cannot continue to respond to and pay for increasingly large disasters. Proper application of hazard mitigation measures and strategies, coupled with wise land use and land development decision-making, can help our communities become more safe and sustainable, and our future as disaster-free as possible

The Role of the Citizen

Each citizen or resident of Michigan has a role in disasters and emergency preparedness, which can help to protect lives during a serious event. The following list of preparedness actions should be studied by each person, with a consideration of the types of hazards described throughout this document.

1. Develop an emergency plan for your household—Even an informal draft plan is a useful starting point! Consider the ways to prepare for the various hazards that could occur in your area, and the ways that would be best to respond. Do you have a way to contact and meet your family members, if something prevents you from staying in or returning to your home? Do you know the most reliable evacuation route if you have to leave your community in an evacuation?
2. Keep a supply of food and water—Consider how many days it is possible for your home or community to be without power or other utilities during a disaster event. You should always possess a supply of fresh water (e.g. in bottles) and food (which does not require refrigeration or cooking) in order to help you endure periods without your community's normal water supply, power supply, and services. In your preparation, include a consideration of the medicines that will be needed. Many emergencies cause a loss of power for 2 or 3 days, so your preparations should allow you to live independently for at least that long (preferably longer).
3. Equip your home and vehicle—At a minimum, some useful items to enable survival during a disaster would include a first aid kit, flashlight with batteries, a battery operated radio, and adequate clothing and blankets. Basic training in first aid may be vital to allow the effects of injuries and weather to be dealt with.
4. During a disaster, use your available communication devices (battery operated radios and phones) to listen for instructions from official sources, and do what you can to obey those instructions. Be prepared to change your evacuation route, for example, if you learn that your original route is unavailable. Consider various alternatives that you could evacuate to (such as friends and family who live in different areas that may be less seriously affected by the emergency).

Most of this document addresses the analysis and mitigation of hazards that could have a serious impact upon Michigan or some of its communities. However, this small section describes personal and household preparedness actions that may become more important to your safety during a disaster than governmental efforts.

Michigan Hazard Mitigation Plan: Planning Preliminaries, Preparation, Participation, and Process

Plan Purpose

This plan and the recommendations made herein are intended to provide the framework and foundation for hazard mitigation within the State of Michigan, in accordance with the planning requirements set forth in the federal Disaster Mitigation Act of 2000 (and in subsequent regulations and FEMA policies). Implementation of this plan should result in greater protection to human life, property and the environment, and less physical, economic, and social disruption to communities and residents from natural, technological and human-related hazards. The ideal end-state is complete integration of hazard mitigation activities, programs, capabilities and actions into normal, day-to-day governmental and private sector functions and business management practices, at all levels of organization, across jurisdictional boundaries, and across all phases of emergency management.

Plan Scope

This plan takes a broad perspective in examining natural hazard mitigation activities and opportunities in the state of Michigan. Special emphasis has been placed on those hazards that have actually caused or could potentially create hazardous conditions resulting in significant threats to public health, safety and welfare, and the social, economic and physical fabric of communities. The plan:

- Identifies and analyzes the primary hazards that have impacted the state, or have the potential to impact the state;
- Analyzes Michigan's vulnerability to those identified hazards in terms of the impacts upon local jurisdictions and state owned/operated critical facilities;
- Estimates potential dollar losses (where applicable) to state owned/operated critical facilities;
- Incorporates hazard mitigation into a broader framework of interagency and interdisciplinary coordination, including land use and comprehensive planning activities, homeland security and military considerations, and draws upon those broader frameworks for additional technical, theoretical, and practical knowledge within the analysis;
- Assesses the current strengths and weaknesses of hazard mitigation and emergency management capabilities and resources in Michigan;
- Achieves a greater level of integration and coordination between state and local planning documents and activities;
- Incorporates hazard mitigation into a broader framework of emergency management preparedness, response, and recovery, and draws upon that broader framework;
- Examines specific hazard mitigation measures that have been taken (and that can be considered) to address hazards in Michigan;
- Documents existing federal, state, local, quasi-public, and private programs and initiatives that directly or indirectly promote hazard mitigation; and
- Recommends both short-term and long-term hazard mitigation opportunities that the state of Michigan, local governments, private industry, non-profit agencies, and individual households should consider implementing.

Most of the measures ultimately recommended are statewide or regional in nature and application. Local hazard mitigation plans developed throughout Michigan contain strategies that are specific to many additional local agencies and sites. Potential resources and methods for implementing recommended measures are also identified. The hazard mitigation opportunities outlined in the plan were identified from a number of sources, including:

- Damage assessment information from recent disasters in Michigan and other states;
- Hazard mitigation projects funded or applied for under various federal and state mitigation programs, in Michigan and in other states;

- The Michigan Hazard Analysis (latest edition, dated July 2012);
- Local hazard analyses, hazard mitigation plans, and land use / comprehensive plans throughout Michigan;
- Disaster case studies and after-action reports from recent disasters in Michigan and other states;
- Hazard analyses and hazard mitigation plans for the adjacent states of Ohio, Indiana, Wisconsin, and the province of Ontario (Canada).
- Hazard mitigation strategy reports and Section 409 hazard mitigation plans from previous disasters in Michigan and other states;
- Hazard mitigation guidance documents, such as MSP/EMHSD Pub. 207, FEMA guidance, special studies, and other academic, theoretical, and scholarly literature and reference materials;
- Emergency management communications (e.g. Law Enforcement Information Network, E-Team, MI-CIMS, National Weather Service, Emergency Alert System) and media reports of recent emergency events or threats; and
- Specific recommendations made by federal, state and local agencies, and private industry.

Legal Authority

This plan is developed under the authority of 1976 PA 390, as amended: the Michigan Emergency Management Act. This Act and its subsequent Administrative Rules provide the Department of State Police with broad authority to carry out the emergency management activities of mitigation, preparedness, response and recovery within the state of Michigan. In addition, it empowers each state department to carry out the emergency tasks assigned to it by the Department of State Police in the Michigan Emergency Management Plan (MEMP) or other means—which include the planning, development, and implementation of hazard mitigation measures.

If a disastrous event in Michigan results in a federal major disaster declaration under Public Law 93-288 (Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended by the Disaster Mitigation Act of 2000), **this plan will serve as the state hazard mitigation plan required under Section 322 of the Act as a condition of receiving federal disaster relief assistance.**

The MHMP also provides assurances that the state will continue to comply with all applicable federal statutes and regulations during the periods for which it receives grant funding, in compliance with 44 CFR 13.11(c), and will amend its plan whenever necessary to reflect changes in state or federal laws and statutes, as required in 44 CFR 13.11(d).

Planning Process

This plan was revised from 2011 to 2014, overseen by the Emergency Management and Homeland Security Division of the Michigan State Police (MSP/EMHSD), working in conjunction with the Michigan Citizen-Community Emergency Response Coordinating Council (MCCERCC) and a wide array of other stakeholders. (A table later in this section provides a list of those stakeholders who contributed to the plan's revision.)

Initial Plan Development: Before the Disaster Mitigation Act of 2000

From a historical perspective, this plan was initially developed as a planning product under the Emergency Management Performance Grant (EMPG) from the Federal Emergency Management Agency (FEMA), and was initially approved as such by FEMA Region V on November 2, 2000 subsequent to Federal Disaster 1346-DR-MI. That plan was developed prior to the enactment of the federal Disaster Mitigation Act (DMA) of 2000 and the subsequent publication of its implementing rules in the Federal Register on February 26, 2002. The initial version of this plan followed existing federal hazard mitigation planning guidance available at the time of its development.

Significant New Planning Requirements Unveiled in the early 2000s

When DMA 2000 Interim Final Rules were published in the Federal Register on February 26, 2002, significant new planning requirements were placed upon the states and their local governments. The most important change was the requirement that states have a FEMA-approved mitigation plan in place by no later than November 1, 2004 in order to remain eligible for all non-emergency forms of federal relief assistance under the Stafford Act. In addition, the new DMA 2000 planning standards were considerably more detailed than were the standards recommended in previous

editions of federal mitigation planning guidance. As a result, the state of Michigan had to initiate a complex planning process, involving numerous individuals and agencies, in a relatively short time period in order to meet the initial November 1, 2004 plan approval deadline under DMA 2000. (Note: the November 1, 2004 deadline was later extended by FEMA to May 1, 2005, which allowed the MSP/EMHSD a bit more flexibility in completing the planning process and Michigan's plan was completed by the end of March 2005.)

Unfortunately, while that was going on there was also an enormous effort to place considerable planning, training, exercising and coordination requirements on the state in order to improve local and state capabilities to respond to and recover from terrorism and related threats in the aftermath of September 11, 2001. These new efforts caused a significant diversion of state and local agency attention, time and resources away from more traditional emergency management and hazard mitigation activities. Tight federal timelines for the various weapons of mass destruction (WMD) grants that were hastily implemented in the post-9/11 period forced the MSP/EMHSD (like other state emergency management agencies around the country) to divert significant numbers of staff to homeland security work. Therefore, completion of the initial version of this plan necessarily took a back seat to other more pressing priorities during much of 2002 and 2003. It is against that backdrop that the development of this plan to meet the DMA 2000 planning requirements began in February of 2004.

Synopsis of 2004-2005 Planning Process

The planning effort for the 2004-05 initial plan development revolved around the Michigan Hazard Mitigation Coordinating Council (MHMCC) – the state's hazard mitigation coordinating body in existence at the time. The 10-member MHMCC joined with the MSP/EMHSD and a wide array of stakeholders (refer to the 2004-05 edition for specifics) to form a large, multi-agency plan development team. The team worked for several months to develop the initial DMA 2000 hazard mitigation plan for the state of Michigan. The plan was officially adopted and formally promulgated by the MHMCC on October 19, 2004, and the State Director and Deputy State Director of Emergency Management and Homeland Security on December 15, 2004 (the two highest ranking emergency management / homeland security officials in Michigan). Governor Jennifer Granholm adopted the plan on behalf of the state of Michigan on March 4, 2005. The plan was subsequently approved by FEMA as a Standard State Hazard Mitigation Plan under the DMA 2000 on March 28, 2005.

Synopsis of 2007-2008 Planning Process

The planning effort for the 2007-08 plan revision was similar in nature to the 2004-05 process, except that staff shortages caused a focus purely upon natural hazards, and entailed a substantial reformat of the plan, to make it less cumbersome and more self-contained. What had previously been separate documents, referred to as attachments, instead had their content made a part of the main planning document, with sections called attachments now functioning more as appendices in a single document. The process was spearheaded by the lead Hazard Mitigation Planner of the MSP/EMHSD, with assistance provided by the other MSP/EMHSD staff (i.e., State Support Unit Manager / State Planner, State Hazard Mitigation Officer and Assistant State Hazard Mitigation Officer, and three planners from the Local Support Unit). The lack of an active hazard mitigation council for several months of 2007 (the MHMCC was abolished on May 2, 2007 and replaced by the new MCCERCC, which met for the first time on January 29, 2008) hampered the effort from the start. Fortunately, the MSP/EMHSD was able to contact key stakeholders and receive input through the state agency Emergency Management Coordinators and/or the subject matter experts in their respective agencies for each natural hazard addressed in the plan. The new MCCERCC membership also had the opportunity to review and comment on the various plan sections as they were revised, as did key MSP/EMHSD subject matter experts and subject matter experts from applicable federal agencies and nongovernmental organizations. Collectively, these individuals constituted the planning team for the 2008 MHMP revision. Due to these many challenges, the decision was made for 2008 plan to focus upon natural hazards.

Synopsis of 2009-2011 Planning Process

The subsequent cycle of plan maintenance involved a more complete update process than was possible in the previous (2008) cycle. First, the Michigan Hazard Mitigation was restored to a full and balanced consideration of all hazards—natural, technological, and human-related. Second, there were no problematic circumstances involving the status of Michigan's official hazard mitigation council (MCCERCC), which met regularly and was heavily involved in the plan update process, along with various partners and associated agencies. Third, the 2011 update process was enhanced by

meeting the additional standards of the Emergency Management Accreditation Program (EMAP), which granted Michigan's emergency management framework a conditional accreditation that is expected to be expanded into full accreditation in 2011. Finally, the plan update was assisted by the availability of FEMA-approved local hazard mitigation plans in the vast majority of Michigan's 83 counties.

Synopsis of 2011-2014 Planning Process

A strong effort was made for this newest plan update to be more evenly stretched across the full three year period that was available. After the 2011 update was completed at the end of March, 2011, new 2010 census data became available, and MSP staff worked to re-analyze the development trends section of this document. This analysis was completed in 2011 and work then turned to an update of the hazard analysis sections, which constituted nearly half of the page count in the 2011 plan. During 2011 and 2012, lead staff at EMHSD proofread, researched, and edited all of the hazard sections, and coordinated with the MCCERCC's Hazard Mitigation Committee to have each section reviewed by subject matter experts in different government departments. EMHSD staff also had weather elements reviewed by a meteorologist from Michigan State University, a meteorologist with WDIV-TV (Metro Detroit), and climate change elements were also offered at meetings of the Michigan Climate Coalition for members' review. Feedback (or approval) was received from all these agencies, and this half of the plan was initially published separately in July 2012, under the title "Michigan Hazard Analysis" (EMHSD Pub. 103). This early work on the hazard analysis half of the plan turned out to be vital for its timely completion, because several major competing demands were soon placed on EMHSD staff afterward. One was the demand that an annual Threat and Hazard Identification and Risk Assessment (THIRA) be completed (at first with limited guidance and an extremely short time schedule)—a task that at first appeared to be strongly related to the Michigan Hazard Mitigation Plan, but whose pre-determined formalisms soon felt much more distracting than helpful. The second was a major disaster declaration that occurred in the Spring of 2013 and required substantial staff time, including numerous reports, meetings, and coordination with temporary field offices. This disaster was for flooding events that occurred between April 16 and May 14, which were then followed by follow up reports and work on recovery activities and hazard mitigation grants which took many months to handle. During mid-2013, a revised draft of the MHMP Goals and Objectives section was distributed to MCCERCC and discussed by its Hazard Mitigation Committee, but those bodies had to dedicate a couple of their meetings to deal with the evaluation of post-disaster hazard mitigation grant applications. By the end of 2013, full-time work had resumed on the MHMP update, but it still took quite some doing to complete with any greater efficiency than during previous updates, just barely being finished before expiration and therefore placing burdens upon the Governor's Office to process its official approval on the originally planned schedule. During 2013, proposed legislation had appeared, which would have lengthened the three-year state update requirement into a 5-year cycle. MSP/EMHSD wholeheartedly supports that proposal, which would not only cause the state plan's time-frame to match those of local plans, but would also provide additional, much-needed time to allow staff to perform the necessary research, review, coordination, and public input opportunities. Although the 2011 edition of the plan had been posted online for review and feedback by anyone, including the full citizenry of Michigan, newly revised drafts of the 2014 plan were additionally posted, in prominent positions, on two government web sites in early 2014 and announced by social network communications (in addition to the existing MCCERCC references and open meetings which had provided a well-established mechanism for inviting review/feedback during the previous updates). The plan was also repeatedly mentioned and placed on the agendas of various meetings with partnering and coordination agencies, such as the Silver Jackets and the Michigan Climate Coalition, during 2013 and 2014, as well as in various presentation and training sessions directed at diverse audiences.

Michigan's Hazard Mitigation Plan (and smaller portions of it, such as the Michigan Hazard Analysis) are widely distributed by MSP/EMHSD, freely available on its web sites (except for the confidential content contained within Attachment A), and always include an open invitation to provide feedback to key personnel (Mike Sobocinski, at sobocinskim@michigan.gov or 517-336-2053) regarding any suggestions upon any part of its content. It is felt that the distribution of these materials to a wide array of recipients is an important part of not only achieving the plan's purpose in building awareness, expertise, and coordination, but also a part of interagency and public engagement, by which feedback is sought and obtained for the improvement of the plan. In addition to the input that is specifically requested for the review and improvement of the plan, MSP/EMHSD personnel continually consider possible ways to improve and refine the content of the MHMP as they attend meetings, workshops, conferences, provide training, or otherwise interact with diverse stakeholders throughout Michigan, including public citizens, who are able to contact

the office directly by phone, fax, and e-mail. For the 2014 update of the MHMP, it is possible a more diverse array of input and subject matter has been considered than for any previous editions of the plan—to the extent that the time to evaluate and include all these information sources could not be completely realized within the available time frame and will therefore have to feed into the next edition of the Michigan Hazard Analysis document (EMHSD Pub. 103) during 2015 (possibly 2016).

Following this general synopsis section is a section that provides more detail about precisely how (and why) each section the plan was revised. The following section provides lists of information to document the extent and nature of the outreach process undertaken by MSP/EMHSD that promoted the MHMP over the past three years and thus encouraged various input to be submitted for consideration in the 2014 MHMP update. Requests for input from numerous agencies were explicitly made at numerous times across the three-year update period (at first mainly for the hazard analysis sections), and a great amount of valuable suggestions and new information was obtained in this manner. Portions of this plan were thus enhanced by a greater awareness and emphasis upon academic, theoretical, and technical perspectives and forms of analysis. Every section of the plan was reviewed, revised, and some were partially rewritten. Great efforts were made to allow the plan to be compatible with the current scholarship, knowledge, and efforts of academic, specialist, and military agencies. The greater availability of digital online resources also proved to be enormously helpful as a source of factual information throughout the process.

Contact and communication between MSP/EMHSD staff and the involved stakeholders occurred through many means—meetings, office visits, e-mail, phone conversations, hardcopy correspondence, and conference activities. A section follows, in which descriptions of stakeholder input are provided—agencies, personnel, dates, and processes/content that were discussed for the 2012 Michigan Hazard Analysis and the 2014 Michigan Hazard Mitigation Plan Update that it led into. (The full revised text of the 2012 Michigan Hazard Analysis document was treated as an update of the 2011 MHMP's corresponding sections, and was further updated during 2013-2014 as a vital core section of the MHMP.) The level of detail used in the following list of stakeholder input has been considered appropriate for compliance with federal DMA 2000 planning requirements. In some cases, these contacts occurred at multiple times on a particular day (e.g., multiple phone calls or e-mail messages), but these are typically only listed once unless the means of contact were markedly different (e.g. a document submission in the morning, followed by an afternoon meeting, would be listed twice). The listed dates alone may reflect different amounts and quality of contact and communication, but for the sake of simplicity and accurate documentation, information is provided by date rather than the number of contacts in a given day. (For example, one phone call might be worth 30 e-mails, or the reverse may be true, depending upon the type of information being evaluated or discussed.) These details are followed by a description of the public involvement process.

Section by Section Summary of Changes Made to the 2014 Plan Update

1. Background Information Section: The text was reviewed for clarity, accuracy, tone, and relevance, resulting in various adjustments made to the wording. MCCERCC information was found to need some amendment, as well.
2. Section on Planning Preliminaries, Preparation, Participation, and Process: The text in this section was similarly reviewed for clarity, accuracy, tone, and relevance. In addition to minor adjustments, the synopses of the planning processes were revised, with the 2011 description pared down considerably, while completely new information about the 2014 update process was added. The list of Stakeholder Input has had its content entirely changed to document the new activities that were specific to the plan update process from 2011 to 2014. Finally, the Public Involvement section was revised to reflect the appropriate new information for the 2014 update.
3. Risk and Vulnerability Assessments Section: The general development process text was proofread and revised where appropriate. Old reference lists have been removed and explanation has been added regarding the difficulties in connection specific content with particular references in previous editions of the document. The list of hazard mitigation strategies has been edited down to mirror changes made in the corresponding hazard analysis subsections (see below). The glossary of mitigation terms was retained and reviewed, with minimal changes.
4. The Hazard Analysis Section: The hazard analysis section had its summary table revised to reflect new information, and the entire section had been reviewed and edited as a result of the updated July 2012 publication of the Michigan Hazard Analysis as well as later work specifically for the 2014 MHMP. Many new descriptions of historic hazard events have been added, and the flood section has been further reshaped to more closely resemble the format of other hazard-specific subsections. Numerous summary tables have been added, as compiled from the

National Climatic Data Center storm events database (online). The section on cyber-attacks has been expanded, while the lists of mitigation strategies have been edited to make them less redundant and more focused specifically upon hazard mitigation (reducing the amount of preparedness and awareness activities). Every page has been scrutinized, resulting in so many minor changes that it would not be appropriate to try to describe them all individually.

5. The Section on Local Vulnerabilities and Development Trends – Text has been revised to reflect the content of local plans that have been updated since 2011. The development pressures and trends section replaced old census data with new, resulting in substantially different lists of communities considered to face development pressures. The explanatory text for that section was reviewed and revised for clarity and accuracy.
6. Coordination Between State and Local Plans – Includes new maps and descriptions, along with substantial critical assessments of hazard mitigation planning and a new work plan to guide state-local outreach and coordination for the next three years. As with all other parts of the plan, each page was scrutinized and amendments have been made to the text in order to improve its clarity, accuracy, and timeliness.
7. Mitigation Strategy Section – The general types of mitigation tools and measures have not changed substantially in the past three years, so the expository text that provides an overview of that information was merely reviewed for clarity and accuracy, with minor adjustments made where needed. The detailed descriptions of hazard mitigation measures has been retained from the previous edition, but many objectives have had their priority level changed, and several new objectives have been added to encourage more emphasis upon significant natural hazards other than flooding. Each objective has had its current status summarized, as of early 2014, and many details have been amended to improve the accuracy, clarity, and timeliness of the content. It was decided to retain the cumulative tables of completed/retracted objectives, due to their value as a historical record, and a new table was added for 2014. The discussion of implementation and project funding was reviewed and still deemed to be appropriate, with more detailed updates incorporated into the sizeable Attachment C, which was revised for 2014 (described below).
8. Plan Monitoring and Update – The section was reviewed and revised as needed to reflect the content and status of the 2014 update.
9. Attachments – The 7 attachments parallel those which had appeared in the 2011 edition.
    - Attachment A (Loss Estimates, Critical Facility Vulnerabilities, and Support Materials) was thoroughly reviewed, with new census data and facility lists used for the 2014 update. New content from MDTMB did not exactly match facility lists from the past, and a new assessment of important (but not necessarily critical) facilities caused the length of the list to grow for this edition, which was considered necessary in order to avoid inadvertently excluding places of substantial importance. A reassessment of the loss estimates was also undertaken, with a de-emphasis upon the risk ascribed to the subsidence hazard which had appeared in previous editions. The public versions of this document do not include "suppressed" information about critical state facilities. A multi-page table of precipitation analysis was moved into the hazard analysis section of the plan, where it would be more readily found and used.
    - Attachment B (Disaster Declarations in Michigan) – The tables have been updated, and a new summary map has been provided.
    - Attachment C (Hazard Mitigation Funding Sources and Projects) – EMHSD grant experts reviewed and updated most of this section, with the balance of its text subjected to scrutiny and editing (for clarity, accuracy, and timeliness).
    - Attachment D (MCCERCC information) – All council information has been updated to describe its current agencies and membership. More detail about specific agency involvement in this plan is provided below, but when this plan refers to the MCCERCC acting as a body, or to a MCCERCC committee (e.g. hazard mitigation committee), this Attachment can be referred to for detail about who was involved in the described activities (or, in the case of the implementation of mitigation objectives, who might be involved in such activities in the future).
    - Attachment E (State Flood Hazard Mitigation Plan) – This is referenced in the flood analysis section, but due to its multi-page nature, was retained as an Attachment so as to preserve the readability and formatting of the hazard analysis. As mere documentation of a previous action, no update was necessary for this 4-page section.
    - Attachment F (Hazard Mitigation Strategies for Federally Declared Disasters) – A 2013 federal declaration resulted in the production of an additional report for disaster #4121, which was added to this Attachment.

- Attachment G (Review Sheets for State and Local Hazard Mitigation Plans) – Updated federal and state forms were added to keep readers and agencies informed about changes that had been made to the review forms and standards since the 2011 plan was adopted. The state review document includes some additional detail and state-specific review information, while presenting the same essential material in a more condensed format than the federal review form.

The following multi-page table provides an overview of the outreach activities, and the known agencies that were most directly involved in these activities. It focuses upon those activities that were most directly related to the maintenance, development, and update of this 2014 MHMP since 2011. In many cases, the very same MSP/EMHSD personnel were involved in both the organizing and providing of outreach and the research/editing process for the 2014 MHMP update.

2011-2014 MHMP Outreach, Input, and Coordination Activities

- April 6, 2011: Contact with Michigan Association of Planning (MAP) re: presentation on hazard mitigation planning at their annual conference (proposal was eventually not accepted by them – August 14, after their review process)
- April 13, 2011: Emergency Management Accreditation Program virtual meeting (conference call), including a discussion of MHMP requirements
- April 22, 2011:Call from MCCERCC member re: Public Health Emergencies
- May 12, 2011: "Brown Bag" lunch discussion meeting on hazard mitigation planning, with Region 6 planning commission related group of attendees
- July to September 2011: Information on local oil/gas well hazards/events was requested from all local EMCs as a part of the round of MSP District Coordinator meetings and presentations by EMHSD staff. Some information was received, but overall, it was found that the degree of risk from this hazard, statewide, appeared to be less than had been thought. (Follow-up investigations took place in 2011-2012 to further investigate the hazard in revising the MHA and MHMP.)
- May 13, 2011: MCCERCC Hazard Mitigation Committee meeting
- June 21, 2011: Contact with Paul Gross (WDIV-TV meteorologist and author of "Extreme Michigan Weather") about the extreme temperatures hazard sections of MHA and MHMP
- June 24, 2011: Oil and gas well materials obtained from MSU research library, plus a governor's report on the topic
- June 24, 2011: Part I of the 2011 MHMP sent to Precious Home Health for preparedness and planning purposes, in response to their inquiry
- July 19, 2011: A final pdf formatted version of the 2011 MHMP was posted on EMHSD web sites for general public review and feedback. (Previous postings had been of the earlier drafts of the document.) This posting was preserved until the new 2014 edition was finalized and posted in its place, and it included a request for comment along with contact information for providing feedback.
- August 1, 2011: Notice of MHMP web-posting was sent to the network of all local Emergency Management Coordinators (EMCs) and also referenced at the round of MSP District Coordinator meetings
- August 2, 2011: MHMP mailing to a full set of MSP partners and stakeholders (and follow-up correction to the email)
- August 4, 2011: Notices of online MHMP posting sent to state agency stakeholders
- August 4, 2011: Outreach to MSU faculty regarding guest lectures on Michigan hazards and hazard mitigation
- August 15, 2011: MCCERCC meeting and review of the MCCERCC coordination plan
- September 1, 2011: Contact MDEQ regarding NFIP information for updated MHA and MHMP
- September 12, 2011: Inquiry from a citizen about flood elevation in the City of Gibraltar
- September 13, 2011: Draft text on "Hazard Mitigation through Planning & Design" developed and considered
- September 28 and 29, 2011: MDCH request to assess the UCLA "Hazard Risk Assessment Instrument" – which was evaluated but not preferred to existing methods, with follow-up discussion occurring in November 2011
- October through December, 2011: SPR meetings (October 19 and 26, November 1, 15, and 22, December 1)

- October 2011: Spreadsheet programming for census trend data analysis (for MHMP development trends update)
- October 31, 2011: MCCERCC Hazard Mitigation Committee meeting
- November 3, 2011: Presentation in MSU urban planning course – UP 400 – about hazard mitigation planning
- November 7, 2011: MCCERCC meeting
- November 8, 2011: MSP/EMHSD Emergency Planning course – includes a module about hazard mitigation planning and information about state plans and guidance documents
- December 19, 2011: Examine information on Climate Change and Public Health, received from MDCH
- January 27, 2012: Contact Michigan Association of Planning about submitting an article for their publications, about the development and availability of the updated Michigan Hazard Mitigation Plan. In April follow-up, MAP contact Lauren Carlson advised about the possibility of publication in their online newsletter, to reach all their members, although a submission would occur well before actual publication (more than a year in their printed magazine, if accepted)
- January 30, 2012: Silver Jackets conference call regarding USGS stream gauge network (described in MHMP objectives) and to seek coordination between Silver Jackets and MCCERCC
- February 2, 2012: Study text on collective behavior (recommended through input from MSU sociology faculty member Dr. Perlstadt) regarding "panic" and "mass hysteria" – ideas that are popularly given more credit than they deserve (text: David L. Miller, second edition, 2000 "Introduction to Collective Behavior and Collective Action"), most heavily reflected in revisions to the Civil Disturbances section of MHA and MHMP
- February 6, 2012: Contact with Paul Gross (WDIV-TV meteorologist) to obtain information for MHA and MHMP – received information about ice storms from him on February 8 for consideration and inclusion
- February 8, 2012: MSP/EMHSD Emergency Planning course – includes a module about hazard mitigation planning and information about state plans and guidance documents
- February 14, 2012: Request and receive MDEQ information on detailed flood analysis techniques – contact with Bruce Menerey, Les Thomas, Linda Burke (February 15)
- March 1, 2012: Presentation at MSU on hazard mitigation and emergency management, for UP490/890 class of graduate students and practicing planning professionals
- March 15, 2012: Contact with Michigan Climate Coalition (MCC)
- March 26-27, 2012: Coordination with MCC begins, with MSP as a new member, explanatory text being sent for inclusion on their web site March 29
- March 29, 2012: Contact with Silver Jackets (SJ) to follow up from January 30
- April 4, 2012: Received THIRA (Threat and Hazard Identification and Risk Assessment) guidance document and mandate from FEMA
- April 10-11, 2012: State Hazard Mitigation Officer (SHMO) conference held in Lansing, and includes discussion of hazard mitigation planning with FEMA
- April 13, 2012: Contact with MDEQ regarding nuclear and hazardous materials text in MHA and MHMP. Ken Yale provides review and feedback (also on April 16)
- May 7-10, 2012: THIRA conference call and meeting (May 8 THIRA training preparation, May 10 THIRA meeting)
- May 12, 2012: THIRA meeting (NOTE: THIRA was one relevant means of coordination about MHMP topics by involved agencies, even though the formal THIRA/SPR process was considered too rigid and artificial for use in the MHMP)
- May 15, 2012: Requested and received cyber-attack information from Denise Barnes of the Michigan Intelligence Operations Center (MIOC) for consideration in MHA and MHMP
- May 16, 2012: Consideration of federal CPG 201 THIRA supplement document
- May 22, 2012: Develop state profile map with GIS staff for use in MHA, draft THIRA, MHMP
- May 25, 2012: Nuclear attack section revisions received from Sean Brady of MSP/GCSD
- May 29, 2012: Revision to grant information section in MHMP – feedback from Sean Brady and Mary Mankowski of MSP/GCSD regarding the terrorism programs and initiatives subsection in MHA and MHMP
- May 30, 2012: Terrorism section and revisions received from Sean Brady of MSP/GCSD for MHA and MHMP

- June 4, 2012: MHA information shared with THIRA draft and incorporates Urban Areas Security Initiative (UASI) regional homeland security plan info (confidential)
- June 6, 2012: National level exercise on cyberterrorism provides some useful information for the cyber-attack section of MHA and MHMP
- June 7-8, 2012: THIRA and SPR training sessions (FEMA Chicago)
- June 11, 2012: MCCERCC Hazard Mitigation Committee meeting
- June 13, 2012: Additional MHA information shared with THIRA draft document
- June 13, 2012: Contact with Michigan National Guard (MING) Allison Etheridge regarding the MING all-hazard plan and MING review of the MHA (which then became part of the 2014 MHMP with further updating). The mutual reviews were accomplished over subsequent months.
- June 18, 2012: MCCERCC meeting includes THIRA presentation
- June 20, 2012: County Business Pattern info from federal Department of Commerce – used for updated state profile information in MHA and MHMP
- June 21, 2012: THIRA meetings begin (additional meetings occurred on June 28, July 12, July 19, July 26, August 2, August 9, August 30, September 13, September 20, September 27, October 4, October 18, October 25, November 8, November 27, and November 29; and conference calls on June 27, July 31, September 26, October 1 and 2, and October 30; THIRA included consideration of worst plausible scenarios for events such as pandemics, cyber-attacks, chemical attacks, winter storms, tornadoes, and improvised explosive device incidents, and thus its scenarios were relevant for numerous sections of the MHA and MHMP)
- June 28, 2012: Discussion with MDEQ Steve Wilson regarding updated oil/gas well information for MHA and MHMP
- July 2, 2012: Well count information received from MDEQ for MHA and MHMP
- July 17, 2012: Meeting with Mike Kenel of Michigan Public Service Commission on THIRA, infrastructure failures, cyber-attacks (also relevant for MHA and MHMP)
- July 18, 2012: Presentations to "Rural and Ready" conference and CERT group, at separate locations in Sault Ste. Marie, on hazard mitigation planning, publicizing the new MHA and requesting review/feedback on MHA and MHMP
- August 15, 2012: Input on hazard mitigation topics provide to MDOT long-range state transportation plan
- August 20, 2012: MCCERCC meeting and presentation
- September 12, 2012: THIRA scenarios work – coordinated with multiple agencies – continues on September 18, 19, 21, 25, 27, October 3, 17, 19, 22, 24, 25, 30, etc.
- September 14, 2012: MDEQ scrap tire information provided by Ronda Euler for MHMP update
- October 3, 2012: Coordination with MDEQ Byron Lane regarding dam safety information for MHMP update
- October 19, 2012: Meeting with MDEQ Byron Lane and visit MDEQ for information on dam emergency action plans
- October 23, 2012: Presentation at MSU in SOC 375 urban sociology class about hazard mitigation concepts and activities in Michigan, including MHA and MHMP
- November 5, 2012: MCCERCC meeting
- November 7, 2012: Presentation on hazard mitigation concepts to MSU class SOC 801 (global transformations)
- November 14, 2012: MSP/EMHSD Emergency Planning course – includes a module about hazard mitigation planning and information about state plans and guidance documents
- January 17, 2013: Michigan Climate Coalition (MCC) meeting in Lansing – seek feedback on climate change text in MHA and MHMP
- January – begin developing updated presentations on hazard mitigation planning for MI-CEMKR (Michigan Core Emergency Management Knowledge Requirements) course; updating of grants table for MHMP
- January 23 and 29, 2013: Develop and revise a local coordination plan for MHMP to prioritize its direct planning assistance to local EM programs in Michigan
- January 28, 2013: Contacts with MCC members regarding Great Lakes water levels, shoreline hazards section of MHA and MHMP sent for review by MDEQ Roger Eberhardt

- January 31, 2013: Web meeting and demonstration to investigate "Odysseus" hazard analysis capabilities (IS consultants)
- February 1, 2013: Request review of MHA/MHMP section by Niles Annelin of MDOT
- February 25, 2013: Review of MHA/MHMP terrorism topics by Sean Brady of MSP/GCSD
- March 5, 2013: MHA/MHMP weather hazards sections sent to MSU meteorologists (in the Department of Geography), then reviewed by Jeff Andresen
- March 7, 2013: Submit proposal for MAP conference session (eventually not accepted by their selection panel)
- March 9, 2013: Received requested information on flood mitigation and RiskMap from Les Thomas of MDEQ
- March 21, 2013: MCC meeting in Lansing
- April 2, 2013: Presentation at MSU in UP 488 (sustainability planning)
- April 3, 2013: Silver Jackets conference call and discussion/arrangements for StreamStats GIS initiative for USGS and coordinating agencies such as MDEQ, MSP, etc.
- April 12, 2013: Contact Jeff Andresen (MSU Geography – meteorologist/climatologist) regarding MHA/MHMP sections
- April 15, 2013: MCCERCC meeting and presentation
- April 16 to May 14, 2013: Disaster 4121: flooding in 16 Michigan counties (produces disaster strategy now included in Attachment F of the MHMP)
- April 19 to 27, 2013: Preparation of new trial event, "Geologic Mapping," on flood risks for the Michigan Science Olympiad held at MSU on March 27, but potentially adaptable for all states in this annual event (educational awareness and outreach on hazard risks and mitigation)
- May 16, 2013: MCC meeting, including discussion of future presentations to the MCCERCC on the topic of climate change
- May 22, 2013: Conference call regarding GLISA coordination and grant availability
- June 17, 2013: MCCERCC meeting and presentation
- June 18, 2013: Inquiry with MDEQ Susan Parker regarding the Toxic Release Inventory (and its potential use in analyzing hazardous materials incidents in MHA and MHMP)
- June 18, 2013: Contact with Ontario Emergency Management (Patricia Martel) and obtain the Ontario HIRA for review. Ontario review of MHA and MHMP invited.
- June 19, 2013: Silver Jackets meeting at MDEQ office (including a phone-in option)
- June 20, 2013: Check with computer expert at MSU (P. Laurens) regarding a good non-technical overview of cyber-attack risks. Received recommendation of Bruce Schneier materials.
- June 24, 2013: FEMA conference call regarding Disaster Mitigation Strategy
- July 1, 2013: Contact EM offices for Ohio, Indiana, and Wisconsin, to invite their review of MHA and MHMP, and obtain hazard mitigation plans for these (adjacent) states for review and consideration
- July 3, 2013: Contact MDEQ Jennifer Wolf regarding County Forest Plan information in Michigan
- July 9, 2013: Grand Rapids meeting with FEMA on disaster 4121 Hazard Mitigation Strategy
- July 9, 2013: Inquire with Gary Becker (MSP Commercial Vehicle Enforcement Division) regarding the transportation accident and hazardous materials sections of the MHA and MHMP
- July 10, 2013: Inquiry from Region 14 planning office (Muskegon; Stephan Carlson) regarding hydraulic fracturing as a potential source of risk to include in hazard mitigation plans (concerns expressed at the local level by citizens). Initial answer is that there is no known concern, but subsequent investigations later become somewhat involved (although ultimately reaching a conclusion that did not change much: few strong reasons for concern in Michigan, unlike some other states, due to differences in bedrock geology, state regulations, and the smaller extent of the extraction industry)
- July 15, 2013: Contact with Tony Adduci (FEMA) regarding the production/assessment of an updated list of critical facilities for the MHMP (Attachment A)
- July 18, 2013: MCC meeting, requested review of Energy Emergency section of MHA/MHMP from David Gard (Michigan Environmental Council)
- July 22, 2013: Contact with MDTMB Kathy Knapp regarding new state facilities data for MHMP

- July 26, 2013: Read Natural Hazard Mitigation Association (NHMA) material (from online)
- July 29, 2013: Obtain US Forest Service wildfire report
- August 5, 2013: MCCERCC Hazard Mitigation Committee meeting
- August 8, 2013: MDOT feedback on hazard mitigation strategies obtained from Eileen Phifer
- August 9, 2013: Contact with Jason Nairn and Jeanette Doll of MDTMB regarding the use of new state facilities lists and their partial processing by Tony Adduci of FEMA (follow-up contact on August 12, 15, and September 20; obtained lists forwarded to Tony on September 23)
- August 9, 2013: Contact with Mary Weidel of Silver Jackets and US Army Corps of Engineers to exchange information for planning purposes
- August 13, 2013: Revised MHMP objectives distributed to MCCERCC Hazard Mitigation Committee members
- August 19, 2013: MCCERCC meeting (pre-council meeting with Hazard Mitigation Committee chair, Phil Schertzing)
- August 23, 2013: Received new THIRA guidance from FEMA
- August 29, 2013: Formal request to MDTMB for state facilities list (Jeanette Doll)
- September 5, 2013: After relaying concerns and interest similar to that of another inquiry (see July 10), the Region 7 planning office sends a series of articles, web links, and references for consideration in the MHMP, about the use of hydraulic fracturing in natural resource extraction industries. (Additional information was sent by the Region 7 office on October 3, 12, 16, 18, 22, 25, 31, November 7, December 2, 7, February 18, 2014, and March 12, 2014.)
- September 19, 2013: MI-CEMKR training includes a 3.5 hour module on hazard mitigation planning (course held by EMHSD at a Spring Arbor College location in Lansing)
- September 20, 2013: FEMA workshop on THIRA/SPR (Vince Parisi)
- September 26, 2013: FEMA webinar on hazard mitigation planning (supported by and announced by MSP/EMHSD for local EMCs)
- September 30, 2013: MCCERCC Hazard Mitigation Committee meeting
- September 30 to October 1, 2013: Receive lists of state facilities from MDTMB and (on October 21) relay them to Tony Adduci of FEMA for some partial initial processing (along with instructions and comparison tables from the 2011 plan)
- October 14, 2013: Review FEMA "losses avoided" study for Michigan
- October 24, 2013: THIRA/SPR conference call
- November 4, 2013: MCCERCC meeting and presentation
- November 21, 2013: MCC meeting and the receipt of Huron River Watershed Council information
- December 4, 2013: Presentation at MSU on Michigan hazards, for SOC 375 urban sociology class
- December 5, 2013: Region 7 planning office (Saginaw) sends information about a propane tanker incident in Cheboygan County, for MHA and MHMP consideration
- December 12, 2013: MI-CEMKR course presentation at MSP Training Academy, including a module on hazard mitigation planning
- December 12, 2013: Contact with MDOT regarding a climate vulnerability assessment process, inviting MSP/EMHSD to participate in the assessment (see January 29, 2014)
- December 18, 2013: THIRA/SPR meeting
- January 14, 2014: Dominic Smith of MDCH sends information on climate change and public health
- January 24, 2014: Received partially processed state facilities information from Tony Adduci (FEMA)
- January 29, 2014: MDOT climate change meeting at Lansing Capital City International Airport
- February 14, 2014: Weather section of MHMP sent to Paul Gross (WDIV-TV meteorologist) for review
- February 15, 2014: Hal Fitch of MDEQ provides feedback on hydraulic fracturing inquiry
- February 18, 2014: New inquiries are made with MDEQ to verify accuracy of MHMP draft text on hydraulic fracturing. (Note: additional email contact made with Jennifer Wolf on February 28 and March 3-4, 2014.)
- February 19, 2014: Requested feedback from USGS is obtained regarding the current status of their StreamStats objective

- February 24, 2014: Drafts of the MHMP are made available on MSP web sites for review/feedback, while they're being finalized—these postings are publicized through social media and web links, MCCERCC open meetings, EMHSD partner agencies and networks, and invited feedback from subject matter experts.
- February 24, 2014: MCCERCC meeting, preceded by Hazard Mitigation Committee meeting
- February 25, 2014: Silver Jackets meeting, information provided about draft MHMP web-postings, and request for feedback on the plan from partnering agencies and their own networked affiliates
- February 27-28, 2014: Feedback on weather sections and climate change references received from Paul Gross (see February 14), with MHMP amendments resulting from this feedback
- March 3, 2014: Contact with MDEQ (Jennifer Wolf, Don Johnson, Mel Kiogima, and Steven Burton), resulting in MHMP review and feedback
- March 6, 2014: Contacted by J. Harkness of CIP (MIOC) regarding MHMP analysis and facilities list
- March 10, 2014: MCCERCC meeting and plan approval (of main sections of the plan, with minor factual and procedural portions which were less relevant for council overview amended afterward for FEMA review and governor's approval, with MCCERCC recommendation of greatest relevance to demonstrate coordinated agency input and facilitation of governor's official approval)
- Late March, 2014: FEMA review of MHMP finds it to meet requirements
- Late March, 2014: MHMP adopted by MSP/EMHSD
- Late March, 2014: MHMP adopted official by Governor Snyder.

NOTE: The preceding list does not attempt to provide a complete list of those who attended presentations, conferences, workshops, meetings, etc. through which MSP/EMHSD distributed materials and sought feedback about local/regional hazard vulnerabilities, mitigation project status, and other topics relevant to this plan. To attempt such a list would require access to all of the registration and sign-in information from those events, not all of which were actually hosted by MSP/EMHSD. Therefore, this note has been added to provide examples of some of the non-profit, private, or non-governmental organizations have been involved in these activities and thus have been part of MSP/EMHSD's outreach efforts on behalf of local and state hazard mitigation planning. It should also be noted that today, an agency's web sites often provide a form of official outreach and information from that agency, without any direct agency contact (i.e. interpersonal) needing to take place. A few of these circumstances have been included in the preceding list, especially when they involve agencies not otherwise credited within this updated 2014 MHMP. For example, in the past, an agency might have been contacted in order to formally request information or guidance, but now the same materials might be freely available to obtain through online sources without official contact to request them.

(The same MSP/EMHSD personnel that have trained, overseen, reviewed, coordinated, facilitated, promoted, and otherwise been involved in the production and review of local mitigation plans have also been involved in the core research/editing team involved in the production of this 2014 MHMP update, thus providing a clear and convenient link between the various levels and types of planning, and the partnering agencies of all types that have been involved in these processes.)

Some overarching events occurred during the 2011-2014 update period, including the release of new 2010 census data that included locally detailed breakdowns of key indicators, the collection and multi-agency review between August 2011 and July 2012 of an updated edition of the Michigan Hazard Analysis (which had originally appeared as a part of the 2011 MHMP), new FEMA planning guidance and resulting plan review forms, a May 2012 emergency in the "Duck Lake" wildfire that seriously affected Luce County and part of Schoolcraft County, the start and expansion of federally mandated THIRA/SPR activities, and the federally declared 4121 flooding disaster in 16 counties during mid-2013, after which the procedure of updating the MHA and the rest of the MHMP was resumed.

The various conferences, training courses, and coordination meetings in which MSP/EMHSD has participated have included attendees from an enormous variety of professions and organizational types. Other sections of this plan have referred to the coordination with Native American organizations, the urban/regional planning profession, emergency management and response organizations, and governmental entities at all levels. In addition, however, there exist many connections with non-profit, corporate, and non-governmental agencies—often through attendance at meetings,

conferences, training courses, emergency management exercises, and other means of outreach and coordination. These have included representatives from hospitals and health agencies, the insurance industry, radio operators (R.A.C.E.S./ARES), businesses (often risk-management personnel or other key persons concerned with safety and hazard mitigation), schools and private colleges, the American Red Cross, and even large corporations such as Michigan's major automotive manufacturers. Outreach to subject matter experts in academia has also been maintained, and subject matter experts consulted where appropriate for their knowledge, regardless of current employment. For example, a meteorologist for a broadcast television station provided important information and review of weather hazard sections, various survey organizations both private and academic were contacted in developing part of the consequence analysis section. Hazard mitigation plans for the adjacent states of Ohio, Indiana, Wisconsin, and the Canadian Province of Ontario were obtained through the internet and their content considered. At the same time, these agencies were notified by email of the update process for the Michigan plan, and invited to review and comment upon it. Text overview suggests the diversity of the many attendees at conferences and training courses who have been provided with information about hazard mitigation planning, and from whom various information was obtained and considered for inclusion in this updated 2014 MHMP.

Many of these conferences, meetings, training courses, and outreach activities also included members of the general public, who were also provided with contact information usable to reach MSP/EMHSD planning personnel and ask questions or provide comment/feedback about planning processes and documents, including the MHMP.

The most significant recommendation issue received for the 2014 plan, without specifically being requested, involved two separate regional planning offices, each of which had inquired about the risks of hydraulic fracturing. One sent large amounts of material regarding the types and amounts of damage that had been associated with hydraulic fracturing in other states. These materials were given extensive consideration, and some were referred to subject matter experts from the MDEQ for assessment.

Public Involvement and Outreach Activities for the 2014 MHMP update

This plan was developed in coordination with the MCCERCC—a visible state agency with its own web site and a regular open meeting schedule that allows the attendance of citizens. Various citizens have observed the MCCERCC meetings over the years, and although some communication took place that allowed a discussion of hazard mitigation, emergency management, and planning activities, there were no specific comments provided that needed to be reflected specifically in this plan update. Rather, the interaction involved the kind of exchange that has been common in the numerous outreach activities provided by MSP—the provision of information, answering of questions, discussion of planning and mitigation options, provision of guidance and materials, web links, and so on. Reactions to review drafts of the MHMP have been positive, and have given the impression that the document is very impressive for citizens and professionals alike. (It seems to be good enough that most persons, expert or lay, rarely have suggestions about how to improve it. One exception is that some MDNR staff do feel that the Invasive Species chapter should be completely overhauled. This task is therefore planned for the next update of the Michigan Hazard Analysis, during 2015 or 2016.) Interest in MSP training courses and conferences has been strong, and there is continued interest in having EMHSD staff provide outreach to communities (at local meetings) and students (in college courses). Since the same staff members who are involved in these outreach activities are also the ones who are involved in the update of the MHMP (as well as the review of local plans, which have their own associated public involvement requirements), the reactions and ideas of the public could therefore be gauged even when such contacts did not include specific and formal "feedback," and instances of doubt, uncertainties, concerns, confusion, or questions could be discussed personally through these meetings. In other cases, various officials and representatives attended and anonymously relayed concerns or ideas that had been expressed by citizens who had communicated with the jurisdictions or agencies that they oversee or represent. Through such discussions and feedback, various amendments have been made to the text of the MHMP to help update the document to better reflect these concerns, clarify content, and make the sometimes technical aspects of the subject more accessible. As already described, relevant subject matter experts were sought out for involvement and input even if they were not officially representing a specific partnering agency. A pattern was noticed that feedback at the level of state planning was more heavily weighted toward the middle and professional classes, while feedback at the level of local planning was more likely to include a broader array of backgrounds and concerns in its citizens. This makes sense in terms of the greater awareness and direct impact that

the local governments have upon the property and lives of the average citizen, and thus reinforces the need for the state level plan to continue to coordinate with the processes involved in local plan development, and to consider the public input obtained at the local level in terms of its relevance for state-level planning. Obtaining representative citizen feedback is often a challenge for all planning processes—especially those that operate on a fairly specific timeframe and deal with a sometimes complex topic that can include sensitive information (e.g. pipeline locations) that needs to be handled delicately or (as in the case of the state critical facilities list) kept somewhat confidential. Therefore, in addition to the specific outreach and public involvement opportunities described in this plan, MSP/EMHSD personnel have also tried to incorporate additional public concerns as reflected in discussion, newspaper letters/editorials, broadcast media discussions, internet postings, political presentations, and so on. EMHSD planning staff has, since 2012, included in its activities the perusal of compiled media reports that pertain to the Michigan State Police and its activities. In early 2014, an additional compilation activity was added to consideration, involving all identified media reports involving emergency management activities and conditions in Michigan. These, plus weekly updates from the MDNR, are part of the ongoing information sources that are tapped to learn about new events and programs.

The MSP/EMHSD was required by MCCERCC provisions (Michigan Executive Order 2007-18) to operate using certain protocols with regard to the development and revision of the MHMP. As a result, MSP/EMHSD staff activities related to the MHMP were necessarily funneled through the multi-agency MCCERCC framework. Since the creation of the MCCERCC, the MHMP has been included as an agenda item at numerous meetings. (The use of formal agenda items in this way helps to direct specific attention to the MHMP as part of the announcement and open meeting provisions under which the MCCERCC operates within a public government framework). The following is a list of dates (and, when appropriate, MCCERCC minute excerpts) during the current 2011-2014 MHMP update period, for full MCCERCC meetings that were open to public attendance and comment:

- August 15, 2011 – Dr. Wagoner presented the report for the Hazard Mitigation Committee and moved that the Council adopt and approve the 2011 Michigan Hazard Mitigation Plan. Mike Sobocinski, Hazard Mitigation Specialist, presented an update on the plan. Discussion was held on the motion. The motion was adopted.
- November 7, 2011
- June 18, 2012 – Mike Sobocinski introduced the Threat and Hazard identification and Risk Assessment (THIRA), a new Federal Emergency Management Agency (FEMA) process required for all states that use FEMA funds. A THIRA draft document is available for public review and comment on the Michigan State Police Emergency Management and Homeland Security Division web page under Emergency Management and Homeland Security Publications.
- August 20, 2012 – Dr. Wagoner and Mike Sobocinski presented the report for the Hazard Mitigation Committee, which included the review of the Michigan Hazard Analysis and the five steps involved with THIRA, a new Federal Emergency Management Agency (FEMA) mandated process for all states that use FEMA funds.
- November 5, 2012 – Dr. William D. Wagoner and Mike Sobocinski presented the report for the Hazard Mitigation Committee, which included review and updates regarding the Michigan Hazard Analysis and Threat and Hazard Identification and Risk Assessment (THIRA). The review process regarding the THIRA draft document is now complete.
- April 15, 2013 – Mr. Michael Sobocinski presented for the Hazard Mitigation Committee on behalf of Dr. William Wagoner, Chair. Mr. Sobocinski distributed handouts and referenced a one-page update with an attachment from the Federal Register of March 1, 2013. He explained that the handout provides information on the progress toward the required update of the Michigan Hazard Mitigation Plan which was approved in March of 2011. The attachment was a proposal to shift the current three year update cycle into a five year update cycle. Until the proposal becomes official, they must proceed as is because of the importance of the plan. Mr. Sobocinski suggested that the Hazard Mitigation Committee hold a meeting prior to the June MCCERCC meeting in order to begin a more detailed input process.
- June 17, 2013 – Mr. Michael Sobocinski reported on the status of the Hazard Mitigation Plan update, distributed information, and gave an explanation of the process.

- August 19, 2013 – Mr. Michael Sobocinski reported on the Michigan Hazard Mitigation Plan (MHMP) update. He distributed a handout regarding the status of the MHMP update process, as well as a State Hazard Mitigation Strategy proposed list of updated objectives for the 2014 plan edition.
- November 4, 2013 – Dr. Schertzing introduced Mr. Michael Sobocinski who distributed a handout and presented on the status of the Michigan Hazard Mitigation Plan (MHMP) update process.
- February 24, 2014 – Dr. Phillip Schertzing, Chair of the Hazard Mitigation Committee, reported that their Committee had just met. He noted that the current Michigan Hazard Mitigation Plan (MHMP) will expire in March and there is a limited amount of time for the updated plan to be finalized, reviewed, approved, and routed through chain of command prior to submission to FEMA. He proposed that the MCCERCC reconvene in March in order to discuss/vote on the plan. Mr. Michael Sobocinski distributed a handout and presented on the status of the Michigan Hazard Mitigation Plan (MHMP) update process. Chair Kelenske presented a motion that the MCCERCC reconvene on March 10, 11, or 12, 2014, to review the component of the MHMP document, as well as other elements that will be posted on the EMHSD Web site. He noted that information regarding this process will accompany e-mail notification of the March meeting. The motion was supported by Ms. Eileen Phifer. Motion passed.
- March 10, 2014 – Dr. Phil Schertzing summarized that the purpose of the meeting is to seek endorsement from the Council to submit the Michigan Hazard Mitigation Plan (MHMP) to the Governor's Executive Office, through the Michigan State Police chain of command, for approval and signature. He noted that Council members had expressed the need to review a final draft of the Plan to ensure there were no conflicts with their respective departments' policies or programs. As a result, Mr. Michael Sobocinski had received comments and proposed changes pertaining to the goals and objectives component of the Plan. Dr. Schertzing presented a motion for Council members to approve the revised, updated MHMP, which includes a goals and objectives component entitled "Mitigation Opportunities, Recommendations, and Implementation," in order to submit the document to the Federal Emergency Management Agency (FEMA) prior to the current plan's March 25, 2014, expiration date. Mr. Doran Duckworth noted that the MHMP is a state of Michigan government document on which the MCCERCC acts as an advisory body. He indicated there are a number of stringent Federal requirements in the 900 page document, but the key sections are the goals and objectives which are actionable items. There was brief discussion among members regarding the importance of the MHMP as it relates to local emergency management coordinators. Chair Kelenske made a motion to support Dr. Schertzing's MHMP proposal. Motion was supported by Mr. Brad Deacon. Motion passed.

All of these meetings were open to the public and were advertised in accordance with the Council bylaws and the Michigan Open Meetings Act, thus providing various opportunities for citizens and stakeholders to personally attend meetings and offer comment on any topic related to the MHMP, in addition to the ongoing ordinary means available to contact MSP/EMHSD staff by phone, fax, or e-mail regarding the MHMP and related topics. In addition, interested individuals and organizations could submit written comments at any time to the Council and/or the MSP/EMHSD planning staff, using regular U.S. mail or through the MCCERCC web page on the MSP/EMHSD web site (or as also presented on the general michigan.gov web site). These web addresses are
http://www.michigan.gov/msp/0,4643,7-123-60152_62790-14743--,00.html and
http://www.michigan.gov/msp/0,4643,7-123-60152_62790-198426--,00.html ,
and they display clearly identified means for citizens to contact the appropriate staff to provide feedback, as well as to read meeting minutes, agendas, and MCCERCC meeting schedules. The meeting minutes document that public comment opportunities were provided (and occasionally utilized) at Council meetings themselves. (Other means of feedback to MSP/EMHSD staff and MCCERCC committee members, such as by phone, wouldn't necessarily include and relay to staff the means by which the contact information had been obtained, for documentation and analysis of the effectiveness of the feedback opportunities.)

Each edition of the plan itself (and the companion hazard analysis, published in July 2012 as a stand-alone document) has included an invitation for comment, and provided readers with contact information. Any readers of this plan can contact Mike Sobocinski of the MSP/EMHSD, with questions, comments, or recommendations concerning the Michigan Hazard Mitigation Plan. Consideration will be given for the inclusion or revision of information in the 2014 edition of the MHMP until March 2014, after which the information would be considered for the following update

process which is scheduled for completion by March 2014. Mike's primary means of being contacted is by telephone at (517) 336-2053, and by e-mail at sobocinskim@michigan.gov. The 2011 edition of the MHMP had been posted continuously since its publication until its replacement with the new 2014 edition—a total of three years on the MSP/EMHSD web sites with this invitation for feedback and suitable contact information for providing comment.

An MSP/EMHSD web site includes a description of the current MHMP and offers another location where public inquiries and comment about the plan can be guided back to EMHSD planning staff. This web address is http://www.michigan.gov/msp/0,4643,7-123-60152_62790---,00.html.

The MHMP is also distributed through professional networks (such as those of emergency managers and planners), and to those other citizens who have specifically requested a copy. Copies are widely distributed to those personnel and their associated agencies, along with the numerous MSP/EMHSD planning partners who have been involved in the plan's production and update. Editions of the MHMP that include information about Michigan's critical facilities can be made available to authorized personnel only, with the agreement that such information must remain confidential. Document distribution has also included registered participants in MSP/EMHSD training courses.

In accordance with Michigan law, the MSP/EMHSD was required to provide hard copies and CDs of its planning documents to the Library of Michigan for public review at that facility and for distribution to the state's 64 depository libraries. This allows for public review of the Michigan Hazard Mitigation Plan at any of those depository libraries.

For the 2014 update, drafted sections were made available via the web sites during late 2013 and early 2014. For the first time, MSP/EMHSD expanded its notification procedure beyond those already described to make use of newly popular social media resources. MSP/EMHSD used its Twitter account to direct traffic to the 2014 draft Michigan Hazard Mitigation Plan on the appropriate web sites. The division's Twitter account has more than 5,500 followers, consisting of emergency management personnel, media producers and reporters, politicians, and members of the general public.

The opportunity for public input is also required for local planning activities, with their own associated update cycles (every 5 years) that are ongoing in Michigan's counties and major municipalities, and whose results have been analyzed for inclusion in this 2014 plan revision. As already noted, dozens of plan development meetings, training sessions, and coordinating meetings were held across the state since the last MHMP update was federally-approved in 2011. Pertinent comments and ideas from those local planning meetings were noted for consideration during the 2014 update process.

2014 Plan Adoption and Promulgation

The 2014 MHMP process led to official adoption and promulgation by the MCCERCC, the State Director and Deputy State Director of Emergency Management and Homeland Security (the two highest ranking emergency management / homeland security officials in Michigan), and Governor Rick Snyder. The final dates for these parts of the process can be found on the official promulgation letters that appear at the beginning of the document (immediately following the Table of Contents, before page 1). Sections of the plan were submitted electronically for FEMA review starting in February 2014, and that process was completed in March 2014, with a final version of the MHMP then submitted in its entirety to the FEMA Region V office in Chicago, after approval was received for the review draft and after state promulgation activities had been completed. With that submission, approval was requested as a Standard State Hazard Mitigation Plan under the standards of the Disaster Mitigation Act of 2000, and based upon FEMA's favorable review of the advance review draft of the document. The plan will also be provided to EMAP for use in that organization's upcoming accreditation decision regarding Michigan's status as an EMAP-accredited state, to maintain continued accreditation status.

Plan Distribution

The final plan will be published online, and also available upon request (or for distribution under certain conditions) in CD-ROM and hardcopy formats, and will be distributed to members of the emergency management and homeland security communities, MCCERCC members and their agencies, as well as professional planning agencies and

registered MSP/EMHSD course attendees. Only some of the content in Attachment A is withheld from online posting and other general distribution. Distribution procedures assure that all of MSP/EMHSD's most important partnering agencies, along with interested members of the general public will receive copies of the plan and be encouraged to provide comments and feedback. Copies will also be provided to the Library of Michigan for distribution to depository libraries (in accordance with state law), and to members of the Michigan Legislature, and to stakeholders involved in the 2014 plan review/update process. This plan document itself encourages interested parties to submit comments and suggested revisions to the MCCERCC and/or MSP/EMHSD planning staff for consideration in future updates. The web sites and other contexts of MHMP distribution are designed to invite such feedback.

Integration with Other Ongoing State Planning Efforts

The state mitigation planning effort has been integrated with a number of other, ongoing state-level planning efforts. Various objectives listed under the four goals outlined in the "Mitigation Opportunities, Recommendations, and Implementation" section deal directly with maintaining and/or increasing the coordination of state mitigation efforts with other ongoing state programs and planning efforts. Recent enhancement of the Silver Jackets coordination mechanism, participation of MSP/EMHSD in the Michigan Climate Coalition, continued use of urban planning networks, and similar activities, all provide new and potentially expanding means to coordinate with other planning efforts.

Integrating Hazard Mitigation into the Comprehensive Planning Process

For example, one of the most basic priorities outlined in this plan is the statewide integration of hazard mitigation principles and practices into the comprehensive planning process at the local government level. If such integration were to be achieved on a statewide basis, the state of Michigan could reduce the number of new developments and structures or redeveloped areas that are at risk to a variety of hazards. This effort is being approached from several angles in this plan, including:

- Educating professional and lay planners about mitigation principles and practices to enhance plan integration efforts.
- Encouraging the effective use of land use and land development (regulatory) tools to mitigate hazards.
- Developing and disseminating planning guidance that provides instruction on the integration of mitigation into comprehensive planning.
- Continued participation in national, regional, state, and local efforts to integrate hazard mitigation into land use and land development mechanisms (e.g., through the American Planning Association, Michigan Association of Planning, Michigan Land Use Leadership Council; etc.).
- Coordinating state and local hazard mitigation planning efforts.

(Refer to "Goal 2: Reduce Property Damage" in the "Mitigation Opportunities, Recommendations, and Implementation" section for more detailed background information on and specific objectives related to these integration efforts.)

Integrating Hazard Mitigation into the Michigan Emergency Management Plan

The state hazard mitigation planning effort has also been integrated with the "Michigan Emergency Management Plan (MEMP)," the state's emergency operations plan developed pursuant to 1976 PA 390, as amended (the Michigan Emergency Management Act). The MEMP, which addresses all phases of emergency management, assigns specific mitigation tasks to state agencies in an effort to reduce the hazard vulnerability of state owned/operated facilities, or local facilities that state agencies may assist in the construction of using state and/or federal grant funding. For example, the Michigan Department of Environmental Quality is tasked in the MEMP to "maintain programs to protect the operational and structural integrity of public water distribution and wastewater treatment systems." Similarly, the Michigan Department of Natural Resources is tasked to "coordinate wildfire mitigation and prevention activities" and "promote urban forestry measures to minimize ice- and storm-related damage," and so forth. A number of state agencies have been assigned similar mitigation tasks in the MEMP, which helps to further institutionalize the concept of hazard mitigation in the state's emergency management program. Mitigation activities are being fully incorporated (or strengthened where necessary) in the newest edition of the MEMP. On the flip side, aspects of the MEMP have

shaped portions of this hazard mitigation plan—most notably sections such as Catastrophic Incidents (National Emergencies) and Terrorism. EMAP accreditation standards require this integration of state-level hazard mitigation and emergency response plans.

State Flood Hazard Mitigation Executive Directive

The state hazard mitigation planning effort also helps ensure that mitigation principles and practices are taken into account when state agencies site and construct public facilities and infrastructure such as state buildings and roads and bridges. In fact, for flooding, this has been mandated through the issuance of the Governor's Executive Directive 2001-5, "State Flood Hazard Mitigation" (which can be found in Attachment E). This Executive Directive, issued on September 11, 2001, requires all Michigan state agencies to adhere to the provisions found in the State's original flood hazard mitigation plan—Executive Order 1977-4, dated May 13, 1977—which requires state agencies to evaluate flood hazards when planning and constructing state facilities and avoid flood prone areas to the extent practicable. Executive Order 1977-4 (included as Attachment E) also requires state agencies to flood proof existing facilities whenever practical and economically feasible, attach deed restrictions to flood-prone state lands being sold or distributed to the public, and take flood hazards into consideration when evaluating land use plans submitted for programmatic purposes.

From a practical standpoint, the effectiveness of these two gubernatorial edicts at preventing state agency development in flood hazard areas will be a function of a number of factors, including the willingness of the Governor and the state agencies to enforce the basic hazard mitigation principles, the costs associated with developing in an alternate area, the level of knowledge, understanding and acceptance of mitigation by all involved parties, and the political, social and economic environment in place at the time the decision has to be made. Simply put, a Gubernatorial Executive Order or Directive is only as effective as those involved at the time want it to be. Although essentially carrying the weight of law, such edicts can be rescinded by future Governors or simply ignored by the involved parties. If the Governor does not enforce the measures through the Cabinet-level agency directors and their support staffs, the measures can easily become ineffective. On the other hand, if the Governor in office at the time of the development decision actually enforces the provisions, these two documents can be very effective at limiting or eliminating state-sponsored development in flood hazard areas.

Integration with FEMA Mitigation Programs and Initiatives

The process used to develop this plan is necessarily intertwined with numerous FEMA mitigation programs and initiatives in that 1) the mitigation planning requirement originated at the federal level and the planning therefore must follow the established federal guidelines, 2) some of FEMA's programs can possibly be used to fund the implementation of specific objectives listed under the four established goals in the plan, and 3) the mitigation strategies that are developed subsequent to a federally-declared major disaster in Michigan lead to revised or new planning initiatives to be addressed in the plan.

Community Rating System – National Flood Insurance Program

An example of a FEMA program that is being used to fund the implementation of specific objectives is the Community Rating System (CRS), a voluntary incentive program under the National Flood Insurance Program that is being successfully implemented in Michigan by the Michigan Department of Environmental Quality. (The CRS recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. Flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community actions.) Currently, 19 local Michigan communities participate in the CRS, and several more are due to be added during 2011 (see pages 167-168). Generally, each participating community has either prepared a flood mitigation or is actively working on a plan (in some cases as part of a county- or region-wide planning effort) and has undertaken other floodplain management activities related to public information and education enhancement, mapping and floodplain regulations, flood damage reduction, or flood preparedness. These community activities, in turn, help reduce future flood losses, facilitate a more accurate insurance rating for the community (based on actual risk), and promote awareness of the NFIP and floodplain management.

Federal Hazard Mitigation Grant Programs

The Hazard Mitigation Grant Program (HMGP), Flood Mitigation Assistance Program (FMAP), Pre-Disaster Mitigation Program (PDMP), Project Impact (PI), and the Repetitive Flood Claims Program (RFCP) have all been successfully used in the past to fund hazard mitigation projects listed in this plan or that originated in local plans. In fact, this plan and those local plans are the primary sources of the projects that are considered for funding under these programs. Other projects have been successfully funded under the annual Emergency Management Performance Grant (EMPG), and more recently under the various grant programs established under the Department of Homeland Security (DHS). Please refer to Attachment C, and to the section called "Mitigation Tools and Measures," for extensive information about these programs and projects.

Post-Declaration Hazard Mitigation Strategies

The post-declaration mitigation strategy process has also contributed to the development of this plan in that the issues, concerns, and opportunities identified in those strategies have led to revised or new objectives being added to the plan, and/or new projects to be funded under the various mitigation grant programs. Development of the post-event mitigation strategy necessarily focuses attention on the disaster and its initiating conditions during the short-term recovery period, when mitigation opportunities are available that might otherwise disappear as the long-term recovery process begins. The mitigation strategies were jointly developed by FEMA and the EMD/MSP (with input from other involved federal, state and local agencies) and are signed by both parties as a commitment to implement the strategy to the extent that resources and circumstances allow.

The mitigation strategies that were developed for Federal Disasters 0774, 1028, 1128, 1181, 1226, 1237, 1346, 1413, 1527, 1777, and 4121 are included in Attachment F to this plan and have been incorporated, where appropriate, into specific objectives listed under one or more of the four plan goals. (Prior to Federal Disaster 1181 in Michigan, states were required to develop a more formalized plan—in lieu of the shorter strategy document—in order to meet the requirements set forth in Section 409 of the Stafford Act. Relevant recommendations from Michigan Section 409 plans from Federal Disasters 0774, 1028 and 1128 have been incorporated as objectives under the appropriate mitigation goals in this plan.)

Since it can take some time for after-action reports and mitigation strategies to be developed after a disaster occurs, it is therefore important to have promoted and obtained a widespread awareness of hazard mitigation opportunities and their value during response and recovery efforts. Even if such awareness is only achieved among a portion of the involved responders, emergency managers, and crew leaders, the benefits gained are still notable and important for reducing or preventing future problems. For example, during disaster #1028 (the Northern Michigan Deep Freeze), broken water pipes that needed immediate replacement (a response action) were fortified with freeze-resistant properties so as to prevent future damage from that type of hazard. This was due to a recognition that simple restoration of the pipes would leave them vulnerable to breaks during the next freeze event.

Similarly, any hazard mitigation activities funded under Section 406 can also serve as recognized, documented examples of post-declaration hazard mitigation projects executed as part of a response/recovery phase of emergency management, because Section 406 provides funding for "mitigation measures in conjunction with the repair of the disaster-damaged facilities…performed on the parts of the facility that were actually damaged by the disaster." Michigan has had numerous (post-disaster/recovery) hazard mitigation projects funded under this source, the most recent of which involved those that were funded under disaster #4121 (which took place in 2013). Attachment C provides more information.

Cooperating Technical Partner Program (NFIP Floodplain Mapping)

The Michigan Department of Environmental Quality, Land and Water Management Division (MDEQ/LWMD) also provides works with local communities for which floodplain maps are being developed through its "Cooperating Technical Partner" (CTP) Program. Under the CTP Program, states and local communities with demonstrated resources and expertise are delegated the authority to review and publish National Flood Insurance Program (NFIP) studies without the need for further federal review. The state and local communities, as CTPs, may also process revisions to existing NFIP studies and then re-map the floodplain. Local community resources may include, but are

not limited to, gathering of field data, labor, funding, in-house information, and providing technical expertise to print the floodplain maps. The MDEQ/LWMD devotes staff time and technical expertise to develop hydraulic models and produce the NFIP reports and associated digital floodplain maps which are then made available on the MDEQ/LWMD and FEMA web sites. This information can provide the basis for the community's flood hazard mitigation planning and floodplain management efforts.

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